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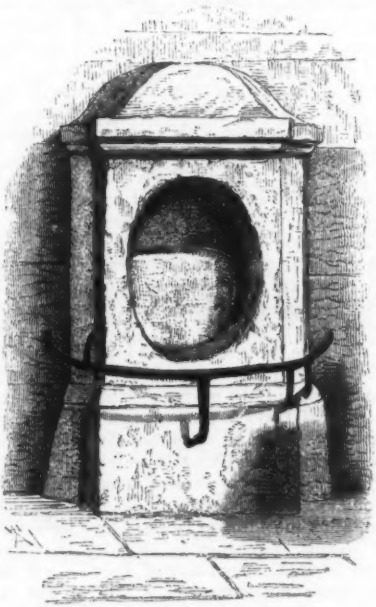
ANCIENT LONDON—ILLUSTRATED BY ITS EXISTING MONUMENTS AND ARCHITECTURAL REMAINS.



THE LONDON STONE.

THE origin of London, the identity of its founders, even the source and signification of the names by which it has been distinguished during nearly the space of the Christian era, are points which, after frequent discussion and much ingenious speculation, still remain without any satisfactory degree of solution.

Walter Mapes, archdeacon of Oxford in the middle of the twelfth century, is said to have met with a history of Britain, written in the British

tongue, while journeying in Armorica, probably in search of archives, of which he has the reputation of having been a diligent investigator. The translation of this chronicle he committed to the charge of Geoffrey Ap David, called Geoffrey of Monmouth; and in the hands of this monk it was increased with Merlin's prophecies and other garbled matter, which, with the probable interpolations of his successors, have had the effect of bringing the entire document into contempt, as wholly fabulous. Indeed its Armorican source appears but doubtful, and the compilation has been considered by the Welsh critics to be no more than a vitiated translation of the 'History of the British Kings,' by Tyssilio or Talian, bishop of St. Asaph in the seventh century.

Respecting the origin of London, the version of Geoffrey informs us that Brutus, a Trojan by descent, being the son of Sylvius and great-grandchild of Æneas, having consulted the oracle of Diana, proceeded to Britain, which he took possession of, and, "considering the state of the kingdom, formed a design of building a city, and in order thereunto, carefully surveyed the country, to discover a place proper for its situation. At last, pitching upon a spot of ground on the bank of the river Thames, very fit for his purpose, he erected a city thereon, and dignified the same with the appellation of New Troy, by which name it was known for many ages, but the same being at length corrupted, it was called Troynovant; and in process of time, when Lud, the brother of Cassibellaum, obtained the government, he encircled the same with a strong and stately wall, adorned with an infinite number of towers of curious workmanship, and changed the name thereof to Caer Lud, or Lud's Town; and commanding the citizens to build houses and public structures of all sorts, it soon equalled, if not excelled, all cities at home and abroad to a great degree. But some time after, the new appellation being corrupted, it was changed into Caer London; and when the kingdom was afterwards conquered and brought into subjection by foreigners, they changed the name thereof to Londres."

This piece of history appears to have been held in full credence by the citizens of London in the reign of Henry VI., according to a Latin document or plea of that time, addressed to the king, in proof of the antiquity and dignity of that city, still in existence, which sets forth as follows:—"Among the noble cities of the universe, extolled by fame, none can be compared to the City of London, the metropolis of your realm, which is esteemed the wonder of the world, both for the wholesomeness of its air, the true faith and practice of the Christian religion amongst its inhabitants, its most worthy liberty, and most ancient foundation. For, according to the credit of chronicles, it is considerably older than Rome, having been founded by Brute, after the form of Great Troy, before Rome was built by Romulus and Remus. Whence to this day it enjoys the liberties, rights, and customs of that ancient city of Troy; for it retains the senatorial dignity and lesser magistrates (*i. e.* Mayor and Aldermen), and its annual sheriffs supply the place of consuls. And whoever repair thither, of whatsoever condition they be, free or servants, they are protected, and obtain their freedom. And almost all the bishops, abbots, and nobles of England have their noble palaces here, and are, as it were, citizens and freemen of this city."* It may be remarked of the above, as well as with respect to the chronicle it is derived from, that they betray a striking misappropriation of events, which in reality took place subsequent to the Roman conquest of Britain; but as regards the line of British kings

* Maitland.

recorded by the early monkish chroniclers, there appears no especial reason why the belief in such a succession should be altogether repudiated. Indeed, that part of British history has been admitted by Leland and some of our best antiquaries and scholars; and Milton, who wrote a history of England down to the Norman conquest, dwells at some length upon the state of Britain previous to the Roman invasion, which he judiciously prefaces as follows:—"Seeing that oft-times relations, heretofore accounted fabulous, have been after found to contain in them many footsteps and relics of something true" .... "I have, therefore," he continues with a reservation, "determined to bestow the telling over even of these reputed tales, be it for nothing else but in favour of our English poets and rhetoricians, who, by their art, will know how to use them judiciously."

After dismissing the tale of the elder Ninnius, relating to the colonization of Britain by the offspring of the fifty daughters of Danaus, king of Argos, and the giants descended from Albion, with other fabulous accounts of the early writers, he further says: "But now of Brutus and his line, with the whole progeny of kings to the entrance of Julius Cæsar, we cannot so easily be discharged. Descents of ancestry, long-continued laws and exploits, not plainly seeming to be borrowed or devised, which, on the common belief, have wrought no small impression, defended by many, denied utterly by few." Four of those kings are said to have been buried in London, and the names of two of them are still locally associated with Billingsgate, as Belin's gate, and Ludgate, and have a certain interest, together with the name of Dowgate or Dwr gate, as the only three names of British origin surviving in this city. Of those localities, and of those descendants of the British kings immediately connected with the period when London became annexed to the Roman empire, there will be occasion for further notice.

It has already been said that the etymology of the word London has been variously construed without any very satisfactory result. The following are the different forms under which it appears in the early writers, together with the constructions which have been put upon them by scholars and archæologists:—Civitas Trinobantes is an expression of Cæsar, presumed with no great certainty to apply to the capital of the Trinobantine kingdom, which extended over the present county of Essex. Tacitus, Ptolemy, and Antoninus agree in the word Londinium; Ammianus Marcellinus speaks of London as an ancient place, formerly called Lundinium, but at the time of his writing, Augusta; in another place he styles it Augusta Trinobantium. The Welsh writers, and others considered fabulous, have added the names Caer Ludd, or city of Lud, and Dian Belin, or city of Diana. Lundenbyrig, Lundenberig, Lundenburg, Lundenwye, Lundenceastre, are Saxon denominations of London, the latter as written by Alfred the Great. The original name of London has been generally determined to have sprung from a Celtic word, and this has been variously construed, the signification of the second syllable dun or thun being accepted as representative of a place of strength or enclosure, corresponding with the word town in the Saxon, and din in the Welsh. The first syllable Lon is convertible into Llawn, full or populous; don, a plain; Llong signifying ships, &c., which latter derivation is corroborated by the statement of Camden, that London is called by one of the ancient British or Welsh bards, Lhong-porth, a harbour of ships. The termination in the Lundenceastre of the illustrious Alfred, is derived by Maitland from a Phœnician word, Caer, respecting which he says: "First be it remembered

that the Phœnicians traded with Britain, after whose arrival, almost all the cities, towns, and villages of Britain were called Caer or Cayer, a general name prefixed to it, either from the founder thereof, or from a river near which it was built, or from the nature of the soil or climate, or from the commodiousness and condition of the place. Thus Caer Lud was given to the Londinium Trinobantium, Caer Iske to Exeter, from its situation on the river Exor Iske, &c.; a word not of a Latin origin, but a pure Oriental word, introduced by the Phœnicians amongst the ancient Britains, and signifying the same as the Saxon words cester, or Chester, and the Latin word castrea."

London, or Londinium, is described by Tacitus, nearly eighteen centuries ago, as a place most renowned for an abundance of merchants and of provisions, although not distinguished by the title of a colony. This was written little more than a century subsequent to the first invasion of Julius Cæsar, and only nineteen years after the expedition under Aulus Plautius, in the reign of Claudius (A.D. 43), when Britain became subject to Roman power. It can hardly be supposed, therefore, that in so short an interval, London could have risen to the condition of wealth and commerce ascribed to it, and it may be concluded that it had become so established upon its own independent resources, previous to any connection with the imperial invaders. The above brief notice of Tacitus is the first ascertained reference to this Trinobantine community, and it suffices to place London among the earliest cities whose existence has continued to the present time, and to place it second only to Rome and Constantinople in point of antiquity; while, as regards its population, and the extension of that commercial status, the renown whereof originates with our knowledge of its existence, it is admitted to stand unrivalled among cities of the modern world. Camaldunum (Maldon), Veruliamium, a seat of British royalty, now St. Albans, and Londinium, appear to have been established by the Romans at about the same time, the first as a colonia, whereby it is concluded to have been entirely of Roman origin;* the second probably from its early submission to Roman sway, as a municipium, under which the native inhabitants retained their own laws, together with the privileges of Roman citizens; while Londinium was made only an emporium under the control of a præfect, who was appointed annually. The imposition of this more rigid form of government is supposed to have been determined on account of the mixed character of the numerous inhabitants, perhaps as a means of commanding a more strict control over the resources of the place; and it may have likewise risen out of the determined character of the recent opposition on the part of the Trinobantines, to the forces of the Emperor Claudius.

The grounds for raising any conception of the extent and aspect of British London are few and slight indeed; but from contemporary reference to other British towns,† the dwellings are presumed to have been constructed of timber from the adjoining forest, and the less substantial material of stake and wattle;‡ the walls so contrived being plastered with

* A coin of Augustus, engraved in Camden, bears on the reverse a man guiding a plough, in which are yoked a bull and a heifer, representing the Roman mode of laying out a city. It is inscribed, COL. CAMALODON AUG.

† Cæsar, and afterwards, Strabo, described the British towns as a collection of huts, erected on a dry spot amid the marshes, or in a clear space of the forest, fenced about with an earthen mound, or a stockade of timber and a ditch, for the protection of the place.

‡ Strabo.

clay for the exclusion of weather, as may be seen in Gloucestershire and other parts of the country at the present time. The magnitude of dwellings belonging to persons of rank or wealth, rather than any superior manifestation of taste, was probably the only feature to distinguish them from other edifices of more humble pretension.

British London is supposed to have been situated on the slope stretching from the site of St. Paul's to Dowgate, a place considered by Pennant to have been the dwr, or water gate of the Britons; granting which, the line of Watling-street may be supposed to represent the main thoroughfare of the British town, as it does the subsequent prætorian way of the Romans. Cæsar obtained his information, preparatory to the invasion of Britain, from the Gaulish merchants; he likewise justifies the invasion itself on the plea that his enemies in Gaul were strengthened by the supplies furnished by the British. London, it may be believed, was one of the sources of those supplies; and the present Dowgate would appear to have been the port of British London, and the mart of the traders from the opposite shores of the Channel. That it became an important feature in Roman London will be described in another place.

The position of London must originally have been one of considerable natural strength, being fronted on the south by the expansive estuary of the Thames, and which Wren presumed to have spread itself as far as the opposite hill of Camberwell, the embankments whereby it was subsequently curbed being still traceable, and which were considered by the same authority to have been of Roman construction. It must be noted, with reference to the situation of the British town, in contiguity to such a flood, that it had the disadvantage of lying considerably lower than the present site, the level of the soil having since undergone a considerable artificial increase, and hence it is to be supposed, that the British town must of necessity have been provided with some defence against the encroachments of the tide; and the discovery, in the course of some excavations on the Thames bank, of the trunks of trees closely rammed, and interlaced with branches, furnished evidence of such a work most probably of the British period. Notwithstanding, however, the fact of extensive Roman foundations, laid on piles, having been discovered in the heart of Roman, and probably likewise, British London, would indicate that the original footing had been of no very stable kind. The stream called the Langbourne, which sprung from the marshy ground now called Fenchurch-street, and which gave its name to the ward so entitled, together with the marshes of Finsbury on the north, the Wall Brook,* which had its rise in the above marshes, and ran into the Thames at the east, and the river Fleet, at the opposite extremity of the British town, rendered its position nearly insular, and capable of repelling any extensive assault from without, on the part of

* The Wall Brook, mentioned in a charter of the Conqueror, as the running water which entered the City, or which ran through the City wall near Moorgate, and across the City from north to south, having several bridges over its course, had in Stow's time, as he states, been built over, so that its course had become "hid underground, and thereby hardly known." With regard to this brook, Mr. Roach Smith, in a communication to the Society of Antiquaries, (Archæologia, vol. xxvii.) says that in the course of excavations on the line of King William-street, there appeared throughout the line vast numbers of wooden piles, which he conceived to have belonged to a channel in the Roman time, intended to drain off the waters from the adjoining marshes, and which, in point of situation, corresponded with the course of the Wall Brook described by Stow.

native or undisciplined foes. In addition to those defences, the land side was closely hemmed in by the primeval forest, which continued undiminished until the reign of Henry II., and is included among the notable features of London enumerated by Fitz-Stephen, a monk of Canterbury, who flourished at that time. This wood, then distinguished as the great forest of Middlesex, abounded in beasts of the chase, among which Fitz-Stephen mentions "the stag, the bucke, the wilde bore, and the bull," *Bos sylvestris*, the skulls of which, frequently dug up, display a vast breadth of frontal, and are one-third longer than those of the common tribe, *Bos taurus*. In the open spaces of those deep groves, the mystic and hideous rites of Druidic paganism, of which Britain is said to have been the chief stronghold, might find an appropriate sphere; and the altar smeared with the blood of human captives, the fiery holocaust, and the obscene vigils and phrenzied clamour in honour of the new moon—enough to outhowl and scare the wild beasts whose lairs they invaded—may have desecrated many a spot where now the hubbub of the market, and the cries of clamorous huxters, agonize, in their turn, the unquiet ear of far-spreading London. A degree of antiquity equal to the dark period of Druidism has been, by some, assigned to a relic otherwise not a little honoured by time and association. This is the well-known fragment especially distinguished as London Stone. In reference to this noted vestige, Stow informs us that "In the end of a faire written Gospell booke, given to Christ's Church in Canterbury, by Ethelstane, king of the West Saxons, I finde noted of lands or rents in London, belonging to the said church, whereof one parcell is described to lye neere unto London Stone;" so that, speculation apart, we find it a boundary of some standing; and it may be remarked, that so far as its present position, encased as it is in a shell of freestone, will admit of examination, it appears to be an unhewn stone, similar to those Druid monuments to which the tool of the mason was not permitted to be applied,* and which we still find in different parts of the country under the name of hoar or hare stone, a name signifying a boundary. A monument of this description exists in the parish of Sancred, in Cornwall, surrounded by a heap of stones. This has been likened to the pillar and heap set up in the covenant between Jacob and Laban:—

"And Jacob took a stone, and set it up for a pillar.

"And Jacob said unto his brethren, Gather stones; and they took stones and made an heap; and they did eat there upon the heap.

"And Laban called it Jegar-sahadutha: but Jacob called it Galeed;

"And Mizpah; for he said, The Lord watch between me and thee, when we are absent one from another.

"And Laban said to Jacob, Behold this heap, and behold this pillar, which I have cast betwixt me and thee;

"This heap be witness, and this pillar be witness, that I will not pass over this heap to thee, and that thou shalt not pass over this heap and this pillar unto me, for harm." †

* Exodus, chapter 20.—"And if thou wilt make me an altar of stone, thou shalt not build it of hewn stone, for if thou lift up thy tool upon it, thou hast polluted it."

† See likewise the stones of memorial set up by command of Joshua, to commemorate the passage of the Ark over Jordan. (Joshua iv. 7.) The piles of stones called cairns, in the northern parts of this country, appear to have been made not only as memorials, but to prevent the passenger from treading on unhallowed ground. The author witnessed, about forty years ago, in

After the great fire of 1666, some excavations were carried on under the direction of Wren, in the neighbourhood of London Stone, which then stood in its original situation on the side of the way opposite to St. Swithin's Church; extensive remains of Roman masonry were discovered, likewise some tessellated pavements; and London Stone itself was found to stand upon foundations of such magnitude, that Wren concluded they must have supported some considerable monument, whereof the stone or central milliarium, which he took it to have been, was only a part, and which he supposed somewhat resembled the *Milliarium Aureum* at Constantinople, which was not in the form of a pillar as at Rome, but an eminent building; for under its roof, according to Cedrenus and Suidas, stood the statues of Constantine and Helena, Trajan, an equestrian statue of Adrian, a statue of Fortune, and many other figures and decorations. Supposing, with Wren, this to have been some considerable edifice in the forum, marking the centre of the Londinium of the Roman empire in the early period of its dominion, and ere the city had extended in a northern and eastern direction, this supposition is corroborated by the coincidence which has been found to exist in point of distance, with the neighbouring stations as laid down in the Itinerary of Antoninus, by which compilation we are likewise informed that out of the fifteen British roads there mentioned, four originated in London, and three others had their termination there. Notwithstanding, however, the reasons by which we are led to believe London Stone to have been a Roman miliarium, we are not absolutely called upon to discredit the presumed British origin of this venerable relic; for it may be justifiable to go further, and to presume the probability of its adoption by the Romans, either as a trophy of conquest, or a monument spared in respect for the conquered, in which case we may behold it with twofold veneration. First, as a solitary remnant of British London—for speculation, once set free, will take a wide flight—the "llwn-thun," or unhewn stone of the Druids, from which the place may have even derived its name. Secondly, as one of the early tokens of Roman influence, and the progress of civilization indicated by the due measurement of roads and setting up milestones to mark the distance from one place to another. But whatever may have been its origin, London Stone appears to have been held as an object of peculiar veneration, as a kind of palladium to the City, and among other instances, it is curiously associated with the font of St. Paul's Cathedral; for long ere London enjoyed a Bourse for the transaction of business, a bargain ratified at either of those places was held to be especially obligatory; and no doubt it was in appeal to this superstition, that the arch-rebel Jack Cade, when he entered London at the head of the Kentish insurgents, marched straight to London Stone, and striking upon it with his staff, announced, "Now is Mortimer lord of this city."

It has been said that London Stone has been transplanted from the opposite side of the way. It is described by Stow as it appeared in his time, in its original situation. "On the south side of this high street" (Cannon-street, in continuation of Watling-street), he says, "near unto the channell is pitched upright a great stone, called London Stone, fixed in

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Northumberland, the interment of a suicide, according to the then barbarous custom, in a cross road, when stones were thrown upon the grave by the spectators, and afterwards by persons passing by, so that a considerable heap, or cairn, was raised. Cross-roads were anciently dedicated to Diana Trivia; and persons buried in such places may have been thus assigned to her in her character of bride of Pluto and goddess of the infernal regions.

the ground very deepe, fastned with barres of iron, and otherwise so strongly set, that if cartes doe runne against it through negligence, the wheels be broken, and the stone itselfe unshaken." Perhaps the advantage maintained by the stone over the cart-wheels may have brought it under the displeasure of the authorities, for about the end of the eighteenth century, London Stone was condemned as a nuisance, and would have been dealt with accordingly, but for the interposition of Mr. Thomas Maiden, of Sherbourne Lane, printer. St. Swithin's Church being at that time (1798) under repair, this worthy printer prevailed upon the churchwardens to take the doomed monument into their tutelage, and this, or a fragment thereof, was built into the church wall, and encased as it now appears; dwindled indeed, and not unlike a Dutch timepiece, in appearance, but great in association—the nucleus of Titanic London, the dethroned Saturn of its remote and misty dawn.

A VISIT TO AUSTRALIA AND ITS GOLD REGIONS.—No. XI.

ITS GEOGRAPHY, ITS MOUNTAINS AND RIVERS, AND BOTANY.

The data in our possession for forming an accurate estimate of the general features of the continent itself are extremly meagre. The surface is too extended, and the explored portion too small to allow us with safety to hazard any general conclusions. The prevailing features, so far as they have yet been observed, have been barren and wooded plains, traversed by long ridges of precipitous but not very lofty mountains, and rivers which often spread into marshes, and do not preserve any course which may be called long, when compared with the size of the continent. There are few deep bays, nor does the sea receive any river, so far as yet discovered, whose magnitude corresponds with that of the land. Notwithstanding the spirited efforts lately made, it is still only a corner of the interior of this huge mass of land that is at all known. A great part of this, through the mixture of broad mountain masses and heavy inundated plains, is rendered unfit for cultivation, and even for travelling; but these obstructions, however, do not prevent the occurrence on a large scale of fine tracts of pasturage, where the richest herbage grows spontaneously, and of fertile soil from which industry may raise the most plentiful crops of every kind of cereal produce.

The Australian continent lies wholly within the southern hemisphere. Its most northern point is Cape York, which is 10° 42′ south of the equator, and Cape Wilson is its most southerly one, which is 39° 9′ south latitude; the breadth of the continent between these points is upwards of two thousand miles, but the average breadth is not more than about twelve hundred. The most westerly point of the Australian mainland is 113°, and the most eastern 153° 47′ east longitude, and its greatest dimensions in this direction are equal to two thousand four hundred miles. The superficial extent of Australia is about three millions of square miles, an area of more than four-fifths as great as that of Europe.

The hilly portions of Australia, so far as at present known, appear to be confined to the neighbourhood of the coasts, or to extend a short distance inland, while the interior spreads out into low and flat plains. The highest mountains yet explored are in the south-east, and are called the Australian Alps, which form a continuous chain, lying at a distance of

from sixty to seventy miles from the coast. The highest measured peak of the Australian Alps is Mount Koskinsko, and is six thousand five hundred feet above the level of the sea. Its summit, even at this moderate elevation, is much above the snow line, and all the higher portions of the chain are covered with perpetual snow. To the northward of the Australian Alps, chains of mountains extend along the whole of the eastern coast, but the only portions which have been explored are the Blue Mountains and the Liverpool range.

The Blue Mountains present on the eastern side a precipitous and inaccessible character. They tower up almost like a wall, their cliffs being so steep and separated by such dreadful abysses as to have been long considered as presenting a barrier absolutely impassable. It was not till 1813 that a route was discovered through them; but at that time the absolute necessity of finding pasturage for the immensely-increased stock of sheep and cattle, roused the active energy of the colonists to endeavour to penetrate the barrier which stood between them and the interior. They found on the western side a series of well-watered downs, affording pasturage for millions of sheep; the lands were speedily occupied, and towns and villages sprang into existence there. And it is in the basin on the western side thus discovered, bounded on the east and south by the Blue Mountains and the Australian Alps, and by the unknown interior to the north-west, that that unexampled supply of gold, the ultimate effect of the discovery of which is affording a new problem to the world, has been so recently found.

The Liverpool range stretches to the northward of the Blue Mountains, and is in many places equally rugged. Its summits are from two thousand to four thousand feet in elevation. Mount Lindesay, situated further to the north, is five thousand seven hundred feet in altitude, and there are many other points in the neighbourhood of the east coast, which are probably of equal elevation.

There is a large number of rivers on the coast-line of Australia, but, as has been already mentioned, few have yet been discovered which bear anything like a proportion to the extent of continent. The most extensive system of rivers at present discovered in the continent belongs to the basin of the Murray, which drains a large tract of the south-eastern portion of the interior. The river Murray rises on the western slope of the Australian Alps, and after flowing for the greater part of its course in a westerly direction, turns to the south, and enters the sea at Encounter Bay, passing through a shallow marsh, called Lake Alexandrina. This lake or marsh presents to the eye a fine sheet of water, twenty-seven miles long by twenty-three broad, but unfortunately its depth is only from six to nine feet, and the channel by which its waters communicate with the sea is exceedingly narrow and dangerous; in fact, the lake appears to be in gradual process of filling up. During the western part of the course of the river it receives the waters of the Murrumbidgee (with its affluent the Lachlan) and the Darling, the latter of which in its upper portion collects the waters of numerous tributary streams. All of these rivers flow from the western side of the Blue Mountains or other ranges of the east coast, and have their upper courses directed towards the interior of the continent. The length of the Murray exceeds twelve hundred miles, and it is navigable for upwards of seven hundred. A premium of two thousand pounds was offered by the Government of South Australia for the first steam-vessel placed, under certain conditions,

upon its waters; but up to the date of the publication of this work no information had been received in this country that the reward had been claimed. There can be but little doubt, however, that the waters of the Murray will ere long re-echo the sound of the paddles of many steamers.

The Australian continent has been described as the land of anomalies. It is summer there when it is winter in Europe, and day with them when it is night with us; the barometer rises before bad weather, and falls before good; the north is the hot wind, and the south the cold; the humblest house is fitted up with cedar, and the fields are fenced with mahogany, and myrtle-trees are burnt for fuel; the swans are black, and the eagles white; the kangaroo, an animal between the squirrel and the deer, has five claws on its fore paws, and three talons like those of a bird, on its hind legs, and yet hops on its tail; the mole (*Ornithorhynchus paradoxus*) lays eggs, and has a duck's bill; the crabs are of an ultramarine colour; there is a bird with a broom in its mouth, instead of a tongue; there are insects which are called, from their appearance and habits, "the walking leaves," and there are fish which are amphibious, leaping over the ground by the aid of their strong spiny fins. The coal district is the most fertile; the bees are stingless; the beautiful flowers for the most part scentless; and the rich plumaged birds are songless—the one which makes the nearest approach to melody being called "the laughing jackass." Weeds in this

Tropical Vegetation.

country become gigantic trees there; the trees are, with one exception, evergreens—the leaves of most of them are set edgeways, instead of horizontally, and some of them shed their bark instead of their leaves; and, while there is, naturally, a total absence of any vegetable production fit for the ordinary food of man, the soil is capable of producing every variety of corn, fruit, or vegetable, whether European or Tropical, which can be planted upon it.

Upwards of 5,700 different plants are known to exist in Australia, and of these only 270 are common to other countries, so that upwards of 5,400 are altogether peculiar to its extraordinary soil. Ferns, nettles, flowers and grasses, having the form, bulk, and habits of trees, are abundant; hard timber, with rosewood, sandalwood, and cedar is plentiful. Some trees yield the purest gums, while the leaves of others are used as tea. The sassafras and castor-oil plant have been discovered. On the northern coasts palms flourish abundantly, and the tropical mangrove exists in those parts nearest the Indian Islands.

With one exception all the trees of Australia are evergreen. No dense woods have been found, and the groves, from a peculiar arrangement of their foliage, present a strange appearance—many of the trees having their leaves hanging with the edge downward. Flowering plants of excessive beauty are found; and the lily, tulip, and honeysuckle grow to the size of large standard trees. There are many odoriferous shrubs, which scent the air to a considerable distance. In the interior, immense numbers of prickly plants cover the ground, binding down the loose soil, and preventing that drift which distinguishes the deserts of Arabia and Africa from the Australian wastes. Although large and excellent pastures form a prominent feature in the aspect of the country, yet a heavy English sward is seldom found. Flax, tobacco, a species of cotton, tares, indigo, chicory, trefoil, and burnet (an excellent substitute for tea), are natural productions. No native trees bearing edible fruit have been found. The peppermint-tree affords an oil efficacious in cholera; the leaves of the tea-plant are not much inferior to those of China; and the bark of the wattle is useful in tanning. European fruits, however, supply the absence of indigenous specimens: the grape, the apple, the peach, the cherry, the apricot, the nectarine, the greengage, the pear, the mulberry, the raspberry, the gooseberry, the currant, the strawberry, the quince, the walnut, the chestnut, all thrive remarkably well—some of them requiring no care whatever in their cultivation. The larger number of European vegetables thrive in the Australian colonies, equally as well as the fruits. Most of the Australian trees are of hard wood, but a very large number are of great utility for ship-building, and also for ordinary and ornamental purposes. Many of the trees are remarkable for their vast height, or enormous dimensions. The Eucalyptus globulus of La Billardière (principally found in Van Diemen's Land) has been observed to attain a height of one hundred and fifty feet, with a girth near the base of from twenty-five to forty feet. Lieutenant Breton mentions one which he saw of a triangular form, one face of which was eighteen feet in width, another nineteen and a half, and the third twenty-two and a half, giving a total girth of sixty feet; and at Illawarra there is a resting-place for travellers, half-way up the mountain, called the Big-tree, which, although the greater part has been consumed by fire, is still one hundred feet high, and three men on horseback may ride into the hollow of the tree without dismounting, and there take shelter. The New Holland lily grows to the height of twenty to twenty-five feet, bearing on its crown blossoms of the richest crimson, each six inches in diameter, from which beautiful birds sip a delicious honey; the leaves are very numerous, sword-shaped, and sometimes six feet long. Several specimens of the extraordinary nettle-tree are twenty feet in height, of proportionately robust habit, and its leaves so highly stimulating as to blister severely on the slightest touch. The fern-trees are also remarkable, and extremely beautiful; their rough stems

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rising to the height of from fifteen to twenty feet, and then throwing out a number of leaves in every direction, each five or six feet, or more, in length, and exactly similar in appearance to those of the common fern.

FERN TREES.

HISTORY OF CAOUTCHOUC.

THE vegetable world supplies us with a few instances of products so important to mankind, whether in a state of civilization or otherwise, as to impress the strongest conviction that they were expressly created for his use. We find their applicability to man's purposes so complete, their utility so direct and evident, that the mind is carried irresistibly to the conclusion, that He who formed all created things for his own pleasure, and to beautify the world we inhabit, formed some which He intended to constitute his special gifts to the human family. If we look at the natural family of the cereals, among which are included wheat, barley, oats, &c., we find a class of plants whose connexion with man, in temperate latitudes, and as high as from 55° to 60° N. lat., is so direct, apparent, and intimate, that it is plain they were formed for his special use, and for that of his brute dependents. The single article, rice, has been said to support by far the greatest number of the human race. What the cereals are to man in a state of civilization—and indeed more—the palms are to the savage inhabitants of the palm-zone of the world. Wine, oil, wax, flour, sugar, salt, says Humboldt, are the produce of this single tribe; to which Von Martius quaintly adds, thread, utensils, weapons, food, and habitations. To the indolent Polynesian the cocoa-palm is the all-in-all. The islander reposes beneath its shade; its fruit supplies him with food and drink; his dwelling is thatched with its ample fronds; its leaves form his basket, its leaflets his fans and bonnets. Out of the fibrous material which

envelops the base of the stalks, he prepares a coarse sort of cloth; the nuts furnish him with drinking vessels, the fibres with material for his cordage, the oil a balm for the living and for the dead. "The noble trunk itself," says Mr. Herman Melville, "is far from being valueless. Sawn into posts, it upholds the islander's dwelling; converted into charcoal, it cooks his food; and supported on blocks of stone, rails in his lands. He impels his canoe through the water with a paddle of the wood, and goes to battle with clubs and spears of the same hard material." Well might Linnæus call this family the vegetable princes, and justly might the cocoa-palm wear the regal crown. These two families—the grasses and the palms—have, however, their chief relation with the direct necessities of human life. As man advances in civilization, his wants increase, and the supply of these wants is scarcely less a necessity, if his progress is to be maintained, than that of his daily food. To supply some of these wants, our age has witnessed the introduction of the remarkable substance at the head of this article. Applicable to a multitude of purposes directly concerned in carrying forward the business of civilized life; yielding readily to manipulation; combining qualities possessed by no other material, and capable of being obtained in sufficient abundance, caoutchouc forms an excellent illustration of the proposition with which we commenced this paper.

If we are to credit M. Duchesne, and most authors who have had to speak of caoutchouc, we must attribute to the French nation the sole merit of its discovery, and of its introduction to the notice of the European world. Four Frenchman, observes M. Duchesne, have united in the course of half a century in giving descriptions of the tree which furnishes this substance, and the concrete juice which exudes from it, so as to render our knowledge of this subject now complete. The first of these was M. De la Condamine. This gentleman, who was a French academician, having been despatched in company with M. Bouguer on a scientific mission to the interior of South America, became acquainted with the tree yielding it, and also with the method of its collection, and forwarded a short note of the fact to the Academy of Sciences in 1736. Subsequently, he furnished a longer statement, which gave a greater detail upon the processes, and the cultivation of the tree: and this has generally been considered to have been the first introduction of any accurate information upon this important substance into Europe. It is, however, deserving of notice, that the knowledge of this substance, and of some of its properities, reached Europe long before the visit of these academicians, for caoutchouc was known in the early part of the last century. And if there be any merit in having been the first to give an account of the substance, it must be taken from the ingenious Frenchman, M. De la Condamine, and given to a Spaniard, Torquedama, whose work was published in the latter part of the sixteenth century. This account is so concise and interesting, that no apology need be made for its introduction into our pages. "There is a tree," he writes, "which the Indians call Usquahuitl; it is held in great estimation, and grows in the hot country. It is not a very high tree; the leaves are round and of an ashy colour. This tree yields a white milky substance, thick and gummy, and in great abundance. To obtain it, they wound the tree with an axe or a cutlass, and from these wounds the liquor drops. The natives collect it in round vessels of different sizes, called in their language, Xicalli, but by us calabashes. In these they allow it to settle in round balls of the size most convenient for the purposes to which they are about to apply them. When quite set, they boil them in water, in which state

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the gum is called Ulli. The Indians who have got no calabashes, smear their bodies over with it (for nature is never without a resource), and when it becomes dry, they remove the whole incrustation, which comes off in the form of a very smooth membrane, its thickness depending upon the will of the party collecting. They then make it into balls, and boil them as before. Anciently they used to play with these balls, striking them against the ground, and making them rise to a great height. But in the game of the Pelota, it was not struck against the ground, but caught upon the hip or shoulder. From the ulli an oil is extracted of great value in various applications. It was formerly much used by the natives, nor have they forgotten its properties now; for it is soft and lubricous, and of especial effect in removing any tightness of the chest. The oil is extracted from the ulli by heat; it starts out in a manner to excite admiration, leaving me nought to compare it unto. The oil is drunk mixed with cocoa, and indeed it softens any other medicine, however hard its quality. It is also found of great service in stopping hæmorrhage, for which it is taken internally. The coagulated ulli is so strong in itself, that a breastplate made of it no arrow will pass through; for being of a nature leathery and membranous, it ejects the point. The kings and the nobles were accustomed anciently to make shoes of the ulli, and to order their fools and jesters, the hump-backed and dwarfs of the palace, to be shod therewith, in order to make them sport, for the wearers could not step without falling, which, with their awkward actions, gave rise to much jesting and merriment." What, we may ask, would be the surprise of this learned Spaniard, were he to behold our modern over-shoes made of the same substance?—the wearers of many of which find, particularly on the greasy pavements of our streets, that the ancient cause of merriment still survives, in the slipperiness of their gait. "Our people," continues our author, *i.e.* the Spaniards, "used it in waxing their cloaks, which were made of coarse canvas, so as to make them resist water; and in truth it is of great effect in resisting the water, but not so the sun, for the rays thereof melt it." From this paragraph we learn that India-rubber water-proof cloaks were in use nearly two centuries before the mackintosh, and that their first inventors were the Spaniards. The whole of this account is highly interesting, as it proves that from time immemorial the savage people inhabiting the luxuriant virgin forests of South America, have perceived the value and applicability of this substance to the purposes of life. The account leaves no doubt in the mind, that to the Spanish nation, rather than to the French, the honour of the first published and complete account of caoutchouc is to be awarded.

The following is De la Condamine's own account of this substance. "The rosin named, Cahout-chou, in those countries of the province of Quito adjacent to the sea, is very common also on banks of the Maranon, and serves for the same uses. When it is fresh they work it with moulds into what shape they please, and it is impenetrable by the rain. But what renders it the most remarkable, is its great elasticity. They make bottles thereof, which it is not easy to break; boots and hollow bowls, which may be squeezed flat, and, when no longer under restraint, resume their first form. The Portuguese of Para have learnt of the Omaquas to make squirts or syringes thereof, that have no need of piston or sucker; they are made hollow in the form of a pear when scooped, having a little hole at the small end, to which a pipe of the same size is fitted; they are then filled with water, and by squeezing them they have the same effect as a common

squirt! This machine is mightily in vogue amongst the Omaquas; when they meet together by themselves for any merry-making, the master of the house never fails to present one to each of his guests; and the use of the squirt with them is always the prelude to their most solemn feasts." This instrument is now most extensively employed in medical practice in our own age, and is sometimes spoken of as though it were a discovery due to the ingenuity of our modern mechanicians. The whimsical custom in question led the Portuguese to call the tree that produced the substance from which the syringes were made, Pao di Xirringa, a name still retained, as the trees are often called in America, the Seringa trees.

M. De la Condamine, being unable to prosecute further inquiries upon this subject, it was investigated by a M. Fresneau, an engineer, who had spent many years at Cazenove, in Guiana. Having seen a number of curious things made of caoutchouc, which were brought by the Portuguese and Indians from time to time to Para, he became extremely desirous of discovering the tree yielding so remarkable a material. He made a number of inquiries of the Indians, offering them valuable presents for any intelligence they would furnish him as to these trees. Failing to elicit the least information from them, he determined to hunt out the trees for himself. For a long time all his attempts were fruitless. Ultimately, however, he discovered a number of trees, and returned from his mission laden with a pair of caoutchouc boots, some elastic bottles, bracelets, &c. An account of his undertaking was published by the French Academy in 1751.

Subsequently, M. Aublet, who published a valuable work in 1775 upon the plants of Guiana, gives a very tolerable botanical account of the tree, which he had not the opportunity of seeing when flowering. He mentions that the fruit was eatable, and was much sought after by the natives. He partook also of the same fruit without experiencing any inconvenience from his repast. He gives the following statement of the method adopted for the collection of caoutchouc:—"The natives begin by making at the bottom of the trunk a deep gash, which penetrates into the wood. They then make another incision from the upper part of the trunk vertically downwards to the former one, and at various distances a number of oblique incisions are made, running into the first. These incisions form channels for the oozing sap, and convey it into a vessel placed for this purpose at the foot of the tree. In this the sap collects, loses its moisture, and becomes a soft elastic mass, which, when quite fresh, is readily made to take the shape of any instruments or vessels upon which it is applied, layer by layer. These are then dried by exposure to the fire. The moulds are sometimes made of unbaked clay, and are then removed by pouring in water, which softens them, so that the caoutchouc alone remains. Sometimes they are made of baked clay, and are removed by being broken to pieces, the elasticity of caoutchouc enabling it to bear the violence necessary, without injury to its structure." M. Richard, the eminent botanist, completed the account of the tree, and described its true botanical characters.

ADVICE.

NEVER build after you are five-and-forty; have five years' income in hand before you lay a brick, and always calculate the expense at double the estimate.—KETT.

CURIOSITIES OF PHYSICAL GEOGRAPHY.—No. II.

We will now turn to the mighty deep, and to the waters of the globe generally. The depth of the ocean is very great in some places; for north of the Bermudas it was found to be nearly six miles. The pressure increases as we descend, and is so great that wood, which has been sunk to a considerable depth, has its pores penetrated with water to such a degree that it will no longer float. The ocean is darker than the darkest night in its lower regions; but in some part of the Arctic seas shells are clearly visible in four hundred and eighty feet of water; and in the West Indian seas the bottom is quite distinct at the same depth, the various hues of the submarine occupants of the ground being beautifully apparent. The true colour of the ocean is ultramarine, but every flitting cloud alters it, and organic and inorganic substances often tinge its waters: it is white in the Gulf of Guinea; black round the Maldives; vermilion off California; and so green in one place off the coast of Arabia that a ship has been seen to be in green water and blue at one time. Its saltness varies, the southern hemisphere being more salt than the northern; but the water of the lake of Eltonsk, east of the Volga, contains the greatest proportion of saline matter, and is thereby rendered the most buoyant water known. The Dead Sea is so saturated with salt that it irritates the skin, and towards the south pillars of this substance project from beds of sandstone. The waters of the Caspian are becoming more saline and smaller in quantity, because more water is evaporated than is supplied to it, though it receives large rivers and has no outlet. This sea is subject to heavy winds, which drive the waters over the land; a vessel was thus washed forty-six miles inland, and there stranded. The highest known waves are seen off the Cape of Good Hope in a north-west gale: their greatest height is probably about forty feet from the trough of the wave to its summit. The tremendous breakers on the west coast of Ireland occasionally rise one hundred and fifty feet, and the Bell Rock lighthouse, one hundred and twelve feet high, is actually enveloped in foam, when there is no wind, by the ground swell. A dry wind raises the sea more than a wet one; but in a gale the water is probably calm two hundred or three hundred feet below the surface. Vast currents occur in various parts of the ocean, and tropical seeds are brought by them in abundance to the coasts of Ireland and the Hebrides. In some parts of the Caribbean Sea it is said that a boat may be kept at rest on the surface of a sweeping current by lowering a heavy body down to some depth, where another current, running in an opposite direction, neutralizes the power of the upper one to drift the boat along. Winds and currents cause a necessarily circuitous voyage from Jamaica to the lesser Antilles to take nearly as many weeks as it takes days to return.

Could the Russians pass over the pole and through Behring Straits to their North American settlements, they would save a voyage of about twenty thousand miles. Icebergs drift into the Atlantic two thousand miles from their starting-place in the Arctic seas, and cool the water perceptibly for thirty or forty miles around them, and the air much further. Ross met with multitudes in the South Polar seas with perpendicular sides, from one hundred to one hundred and eighty feet high, and some were several miles in circumference. The seasons are not supposed to influence the ocean to a greater depth than three hundred feet. In a course of experiments it was found that a sounding lead

lowered to the depth of six hundred feet was so hot when raised that it could not be handled; this was probably owing to a submarine volcano or hot spring. The tide at Bristol sometimes rises fifty feet, and even reaches one hundred and twenty feet in the Bay of Fundy, in Nova Scotia, whilst there is scarcely any tide in the islands of the Pacific; up the Amazon it is perceptible for five hundred and seventy-six miles. The famous Maelstrom, on the coast of Norway, is a mile and a half in diameter, and the roar of this whirlpool is so loud that it can be heard miles off. In the rocks of Cephalonia there is a cavity into which the Mediterranean has been flowing for ages. The lakes of America contain more than one-half of the fresh water on the earth. The river Niagara unites two of these lakes, and forms the celebrated falls—the most sublime known. Lake Ontario and Lake Erie appear to be increasing in size; and in one of the bays of Lake Huron thunder is continually heard. A large lake of fresh water was formed in one night in Japan simultaneously with the uprising of a volcano from the earth. At the eastern end of Java there is a lake whose waters contain sulphuric acid, from which a river flows wherein no living creature is found, nor can fish live in the sea near its mouth. A fall of one foot in 200 renders a river unnavigable. The Rhone, which flows very rapidly, falls one foot in 2,620, and has a velocity of 120 feet per minute. The Amazon, with its enormous mass of waters meeting the opposing tidal current from the ocean at a short distance from land, raises a terrific wave at spring tides, which carries devastation before it, shaking the very islands, it is asserted, in its passage. The Rio de la Plata is never less than one hundred and seventy miles across for two hundred miles from its mouth, and its muddy water discolours the Atlantic for two hundred miles. The swift and turbid Mississippi sweeps away whole forests when flooded, and the trees, heaped together in thick masses, are carried down and deposited at its mouth, and in the Mexican Gulf, over hundreds of square miles. These rafts are from six to ten feet thick, and often several miles in length. A stream which joins the Magdalena forms the cataract of Zequendama, where the river, rushing through a chasm, descends five hundred and thirty feet at two bounds into a dark pool, illumined only at noon by a few feeble rays, and sending up a cloud of vapour visible fifteen miles off. The rivers of equatorial America vary in colour; both white and black waters are found there. In boring artesian wells, which are often of great depth, the water frequently spouts up to the height of forty and fifty feet. There is a hot spring in South America which has a temperature of 206° 6′.

Truly may we say with the Psalmist, "They that go down to the sea in ships, that do business in great waters, these see the works of the Lord, and His wonders in the deep."

Next in order comes the earth—"the round world," which "cannot be moved." This immense globe, nearly twenty-five thousand miles in circumference, sweeps along in its orbit at the rate of more than eleven hundred miles in a minute, revolving in the same space of time upon its axis with a velocity which turns its equatorial inhabitants through more than seventeen miles. The intensity of gravitation varies from local causes as well as from the form of the earth; it is feeble at Bordeaux, and increases to Clermont Ferraud, Milan, and Padua, this increase being probably caused by dense masses underground. The earth is more than five times as heavy as a globe of water of the same size, and more than twice the weight of a similar globe of granite. There is a stratum of variable depth beneath the surface

at which the temperature is always the same. The small portion of the earth through which man has penetrated—a mere atom of the distance to the centre—is arranged in layers called strata, in some of which the remains of animals and vegetables are found, converted often into stony matter. Amongst these productions of bygone ages were tree ferns fifty feet in height; gigantic plants of the fox-tail tribe; shells shaped like a coiled-up snake and as large as a cart wheel; lizards, some with long swan-like necks, others with enormous eyes, and others with wings. There were also immense lizards, seventy feet in length and fourteen and a half feet in circumference, and huge mammals eighteen feet long with two tusks bent downwards, with which it is supposed to have raked up aquatic plants and to have anchored itself to the bank of the river or lake on whose waters it thus slept floating. In the strata of Lyme Regis, in Dorsetshire, a sepia has been found in such preservation that a part of the black fluid given to it by its beneficent Creator, perhaps millions of years ago, to conceal itself from its enemies, has been used to paint its figure. The Elephas primigenius has been found entire, buried in frozen mud, and has served as food for wolves and dogs. Fossil remains are so numerous that with the exception of the metals and some of the primary rocks, every particle of matter on the surface of the globe has probably once formed a part of some living creature. Mountains are formed of minute shells; the tusks of fossil elephants have formed an article of trade for centuries, and whole islands in the Arctic regions are chiefly composed of the remains of such elephants. Coal—a collection of fossilised vegetable matter—occupies enormous spaces; the Appalachian coal-field in North America has an area of sixty-three thousand square miles, and that of Illinois, in the same country, is nearly as large as England. Could a person be raised above a point near Falmouth, until a whole hemisphere became visible, he would see the greatest quantity of land which can be beheld from any one place; and if raised above New Zealand, he would see the greatest quantity of water, so that England is nearly in the centre of the greatest mass of land. Nearly three-fourths of the surface of the globe is occupied by water. The Silla of Caraccas rises abruptly from the Caribbean Sea at an angle of 53° 28′, to the height of between six and seven thousand feet, which is the closest approach to perpendicularity of any known great elevation. Glaciers, a mixture of snow, ice, and water, move in the Alps at a rate of from twelve to twenty-five feet annually; but some there have not altered in shape or position from time immemorial, whilst others cover ground formerly cultivated. It is calculated that there are four hundred in the Alps alone, varying from three to fifteen miles in length and from one to two and a quarter miles in width; some of these have a thickness of six hundred feet. One pass across the Himalaya Mountains is twenty thousand feet above the sea, or more than four thousand feet higher than Mont Blanc. The journey over the lofty passes in this range of mountains is terrific; many animals die from the rarity of the air; birds perish by thousands from the wind, and violent storms add to the horrors of the passage. In the dreary regions of North-Eastern Siberia, Wrangel tells us that the people, and even the snow, both give forth a steam, and this vapour is instantly changed into millions of needles of ice, which make a noise in the air like torn satin. The raven in its flight leaves a long line of vapour behind, and the trunks of the thickest trees rend with a loud report. In the southern parts of these regions the glowing heat of summer produces a change like magic; the snow is scarcely gone when flowers of

various hues blossom, seed, and die in a few months. In the province of Cutch, in Hindostan, seven thousand square miles are alternately a sandy desert and an inland sea, for in April the wind drives the waters of the ocean over this tract of land, leaving bare a few grassy elevations on which wild asses feed. In Central Arabia a plummet was sunk to the depth of three hundred and sixty feet in the sand without finding a bottom. The Sahara Desert—as large as the Mediterranean Sea—is alternately burnt with heat and pinched with cold; and at the equinoxes the roaring of wind raises such clouds of sand that it is as dark as night at mid-day. The hot air in this desert is like a red vapour, and in the northern part of it saline particles raised into the air by the winds from the salt-encrusted ground glitter like diamonds in the sunlight. In the Andes there are cities, villages, and mines, at greater heights than the summit of what we consider lofty mountains: the highest city in the world is Potosi. Near Charichana, in South America, there is a rock which is musical at sunrise; something similar occurs at Mount Sinai. Immense plains are found in different parts of the earth, often nearly as level as the sea; there is frequently no eminence one foot high in two hundred and seventy square miles in the South American plains, some of which are covered with impenetrable thistles ten feet high; others with grass mingled with brilliant flowers, where thousands of horses and cattle feed; others by swamps and bogs which are annually flooded for thousands of square miles, when multitudes of animals perish, so that in some places they give the ground the odour of musk; others by thorny bushes and dwarf trees; others by dense impassable forests, in which myriads of animals live, filling the night air with one loud inharmonious roar, not continuously, but in bursts. Millions of animals occasionally perish on some of these plains, when their arid vegetation gets on fire from any cause. In North America, there is a tract of saline ground which is often covered to the depth of two or three inches with salt. In Canada, the trees with their branches are sometimes covered with ice an inch in thickness, whilst icicles hang from the boughs. The least wind brings them crashing down, and, should a breeze spring up, the forest at length gives way, tree after tree falls, carrying all before it, till the whole place resounds with terrific discharges like those of artillery. The highest mountain known is Kunchinjunga, in the Himalaya range, whose estimated altitude is 28,178 feet, or more than five miles and a quarter. If the Pyrenees were pulverised and spread over Europe, the ground would be raised six feet. There is a coral reef off the N.E. coast of Australia which is twelve hundred miles long, and which varies from two hundred yards to a mile in breadth for one thousand miles, during which its average distance from the shore is from twenty to thirty miles. In one part this grandest of all coral formations extends for more than three hundred and fifty miles without a single opening, and the break of the ocean swell upon it is described as majestic. Volcanos are more thickly distributed in Java than in any other place of equal size: in 1772, about ninety square miles of the surrounding country were carried down along with a huge volcano, the greater part of which was actually swallowed up; forty villages were destroyed by this catastrophe. In 1815, explosions from Sumbawa were heard nine hundred and seventy miles off, and in Java, at the distance of three hundred miles, the day was rendered as dark as midnight by ashes from this place; the ocean was found covered by them to the depth of two feet at the distance of more than one thousand miles, forming a mass, through which vessels, with difficulty, forced their way.

A traveller, who visited the crater of a volcano in the Sandwich Islands, in 1834, describes it as a deep basin of five square miles in extent, covered with masses of lava. It contained two lakes of this substance in a liquid state, in each of which there was a boiling caldron sending forth jets from twenty to seventy feet high occasionally, and streams of lava partially stayed in their fiery course by escaping gases, which threw backwards huge blocks, and actually spun them into glassy threads, borne by the wind like the refuse of a flax mill. This terrible commotion is carried on with a noise which is indescribable. A terrific eruption occurred in Iceland, in 1783, continuing for many weeks; the sun was hid for a long period by vapours, and a stream of lava, from twenty to thirty miles broad in some places, ran for nearly fifty miles, drying up some rivers and causing others to boil. In 1839, a lofty volcano was discovered in the South Polar regions covered with ice and snow from its base to its summit; from a cape not far distant, a perpendicular wall of ice, from one to two hundred feet in thickness, was traced for three hundred miles. This mass of ice was altogether about one thousand feet thick, including that part of it which was below the surface of the sea, and there was not a single fissure seen in it. Some volcanos emit only streams of boiling water, others mud, others gas and water. There are fire springs in China; they are holes of great depth from which gases issue, sending up a flame to the neight of twenty or thirty feet, with a noise like thunder, when a light is applied. The valley of death in Java is a fearful instance of the effects of the emission of gases; it is a hollow, a mile in circumference, and about thirty-five feet in depth, whose bottom is covered with the bones of men, animals, and birds—no living thing can enter it without being suffocated. The village of Fredonia, in the State of New York, is lighted with gas which exhales from the earth. In 1822, an eruption from the mud volcano of Galungung turned forty square miles into a desert, and destroyed not less than from ten to eleven thousand persons. In March, 1812, an earthquake at Caraccas destroyed ten thousand people in fifty seconds. At the earthquake of Riobamba, in 1797, from thirty to forty thousand persons perished, and many of the corpses were thrown across a river to a height of several hundred feet. It is reckoned not improbable that from one hundred and fifty to two hundred thousand persons perished by each of two earthquakes, one in the year 19, the other in 526.

At Guanaxuato, in Mexico, a subterranean roaring and thundering began in 1784, and lasted above a month; it so terrified the inhabitants that almost all of them quitted the city. In 1743, Guatimala, in Mexico, with all its riches and eight thousand families, was swallowed up by an earthquake; its site is now indicated by a desert. In 1822, a space of not less than one hundred thousand square miles was raised from two to six feet by the great Chili earthquake: beds of oysters, muscles, and other shell-fish were exposed to view. Scientific observers can detect earthquake shocks; in Great Britain sixty distinct ones were observed between July, 1841, and June, 1842.

The Great Geyser, in Iceland, sends forth at regular intervals columns of hot water, from one hundred to one hundred and fifty feet in height, and twenty-eight feet in circumference, followed by great quantities of steam. In a coal-pit in Derbyshire, there is a spring of mineral oil which throws up from thirty to one hundred and fifty gallons daily; the city of Milan is lighted with oil which springs from the ground. In one of the many mines in Cornwall, and that perhaps not one of the most extensive, the depth of

all the shafts added together is about twenty-five miles, and 2,500 people are employed in it. The greatest depth to which man has penetrated is 3,378 feet, in the now inaccessible mine of Kuttenburg, in Bohemia. At Fredericshall, in Norway, there is a cavern 11,000 feet deep. The largest diamond known is one found in Borneo, weighing 367 carats, and valued at 269,378*l.* In 1826, a piece of gold weighing twenty-three pounds was found at the foot of the Ural Mountains; eight hundred pounds was the weight of a mass of pure silver found in America. It is computed that the silver taken from the American mines, between the discovery of the New World and the year 1803, would form a globe eighty-nine feet in diameter. Twelve hundred tons of quicksilver are extracted every year from the mines of Almaden, in Spain; those of Guancavelica, in Peru, now almost abandoned, had produced fifty-four thousand tons at the commencement of the present century.

Here we pause for the present, with the exclamation of the Psalmist, "O Lord, how manifold are Thy works! in wisdom hast Thou made them all."

THE HAPPIEST DAY IN THE WEEK.

THE dew still glittered on the leaves of the thorn, still hung on the flowers of the woodbine, and sparkled on the harebell, when little Martha Truman tripped down the lane which led from her own cottage to a small but neat row of almshouses, belonging to the town of W——, in one of which lived a very respectable woman, who had been for many years blind. It was Martha's office to lead Nurse Clark to church, and as this was some distance from the village in which she lived, she was obliged to be thus early. She filled her hands with all the flowers she could collect, and then, fearful lest she should have overstaid her time, ran almost the remainder of the way.

"How are you, Nurse?" said she, as she entered the neat little apartment. "I hope you are quite well this morning. Look what a beautiful nosegay I have brought you." Nurse shook her head. "Ah! dear, dear," resumed Martha, mournfully, "I forgot you could not see; but smell," added she, with her wonted cheerfulness, "smell how sweet they are—you *can* do that."

She held the flowers to the good woman's head as she spoke. Nurse praised their fragrance, thanked her kind little friend, begged her to put them into a broken pitcher to which she directed her, and then place them within the grate.

After resting for a short time, the pair left the cottage and proceeded across the meadows to the church. The morning was more than usually lovely. Some slight showers of rain had fallen during the night, which had refreshed the face of the country, and given an appearance of universal verdure: the air was scented with the sweetest odour, the birds sung from every thicket and tree, and the bright but tempered beams of the sun spread additional beauty over the surrounding landscape.

"O Nurse!" cried Martha, "what would I give if you could see how pretty everything looks this morning!"

"It is very kind of you to say so, Martha," replied Nurse; "and I should be very happy indeed if I had eyes like you; but since it has pleased God to deprive me of sight, I will not complain. His will be done. He has taken away one blessing, only to bestow on me another—loss of sight has procured me a home: and besides, I have many enjoyments still; I can smell the sweet air, and hear the pretty birds, and (she raised her head, and half threw back her bonnet,) I can feel the soft pure breeze blow over my forehead. O! how pleasant it is! Let us rest a few minutes, Martha, for it is very warm, and we are yet quite early enough for church."

Martha guided the poor woman to a fallen tree, and then seated herself by her side. A light and happy heart makes words flow easily.

"Now, Nurse," said Martha, after a very short pause, during which her bright eyes had glanced on all sides over the fine country that surrounded them, "don't you think that everything is more pleasing, that the flowers smell sweeter, the birds sing more delightfully, on Sunday than on any other day of the week? I don't ask anything about the flowers, they can know nothing of the matter; but do you think the blackbirds and thrushes, and especially the larks, have any notion that it is Sunday?"

"No, certainly, they have not," replied Nurse; "God has given that happiness to human beings only. We alone know that 'this is the day which the Lord has made,' and that we ought to 'be glad and rejoice in it.' Don't you recollect what the good rector said last Sunday?"

"I dare say I shall remember something about it," replied Martha, "if you will repeat a few words."

"'The difference you feel is in your own heart,' said he, 'and not in what you see and hear. It is not that the sun does shine more bright, or that the fields are indeed more fresh, or the flowers more sweet upon this than upon any other day. It is only that we are apt to think thus because our minds are attuned to order, and to piety, and to contemplation.'"

"But don't you wish," said Martha, "it could be Sunday all the week long? would not that be charming?"

"No, Martha, no," replied Nurse, "I wish no such thing. God has ordered it otherwise; and whilst we are on earth we must attend to our earthly duties. The time will come when it will be always Sunday, though not in this world; and as we labour for the rest that the earthly Sabbath brings, so must we be content to labour for the rest of the heavenly Sabbath. But come, we must make the best of our way to church, or we shall be too late."

Martha instantly took the good woman's hand, and led her again into

the path. "Well, Nurse," said she, "I must not contradict you, because you must know better than I. The birds, the fields, the flowers, may be just the same one day as another; but this I must say, and will always say, Sunday is the best and the happiest day of the week."

"Nor will I contradict *you*," returned Nurse. "Sunday is all you say; and God grant that we, and all who feel as we do, may enjoy that Sabbath hereafter which shall know no end."

BISHOP HOOPER.

MARTYR, FEBRUARY 9, 1555.

DR. JOHN HOOPER, Bishop of Gloucester, and eminent for his piety and firmness of character, was one of the noble army of martyrs. A short time before his death he said, "I am come hither to end this life, and to suffer death here, because I will not gainsay the former truth that I have heretofore taught among you in this diocese (of Gloucester) and elsewhere. True it is, that death is bitter and life is sweet; but, alas! consider that the death to come is more bitter, and the life to come is more sweet. Therefore, for the desire and love I have to the one, and the terror and fear of the other, I do not so much regard this death, nor esteem this life, but have settled myself, through the strength of God's Holy Spirit, patiently to pass through the torments and extremities of the fire now prepared for me, rather than to deny the truth of his word, desiring you and others, in the mean time, to commend me to God's mercy in your prayers."

A short time before the Bishop suffered, he was heard thus to pray: "Lord, Thou art a gracious God, and a merciful Redeemer. Have mercy therefore upon me, after thy great mercy, and according to thine inestimable goodness. Thou art ascended into heaven; receive me to be partaker of thy joys, where Thou sittest in equal glory with thy Father. Strengthen me of thy goodness, that I break not the rules of patience; or else assuage the terror of the pains, as shall seem most to thy glory." To others he observed, "I doubt not but God will give strength to abide the extremity of the fire." His last words were, "Lord Jesu, have mercy upon me. Lord Jesu, have mercy upon me: Lord Jesu, receive my spirit." It is remarked, that notwithstanding his great sufferings, he died as quietly as a child in his bed: and we may hope that, as a blessed martyr, he now shares in the bliss prepared for the faithful in Christ before the foundation of the world: for whose constancy, all Christians are bound to praise God.

The following are some of Bishop Hooper's Reflections on death:—

1. He is blessed that loseth his life full of mortal miseries, and findeth the life full of eternal joys. 2. It is a grief to depart from goods and friends; but yet not so much as to depart from grace and heaven itself. 3. There is neither felicity nor adversity of this world, that can appear to be great, if it be weighed with the joys or pains in the world to come. 4. Beware of looking too much on the felicity or the misery of this world; for the consideration and earnest love or fear of either drawing from God. 5. Seeing all our salvation resteth in this, that we die in the Lord, whiles we be in health, let us learn this doctrine well, and exercise the same. 6. It is not a Christian's part to sleep in sin, as an ill soldier, till the trump blow; neither yet to provide for weapon only till his enemy be upon him; but to have it ready, that it serve as time and necessity requireth. 7. Live hereafter virtuously, that we may die godly. 8. Make ready, therefore, while ye have time for yourselves, in the blood of Christ, and study amendment of life. 9. Of none ye may learn so well as by the life and death, and also the doctrine, of the patriarchs, prophets, Christ, and the apostles; whose example, if ye follow not here, in case hereafter ye never come where they be, thank yourselves.

ADDRESS TO THE NIGHTINGALE.

THE following poem has been generally attributed to Shakspeare, but it is now believed to have been written by Richard Barnfield, who lived at the end of the sixteenth century. Music has given the early stanzas a wide celebrity, which the moral of the later ones equally deserve.

As it fell upon a day
In the merry month of May,
Sitting in a pleasant shade
Which a grove of myrtles made;
Beasts did leap and birds did sing,
Trees did grow, and plants did spring;
Every thing did banish moan
Save the nightingale alone;
She, poor bird, as all forlorn,
Lean'd her breast up-till a thorn;
And there sung the dolefull'st ditty,
That to hear it was great pity.
Fie, fie, fie, now would she cry;
Teru, teru, by and bye;
That to hear her so complain
Scarce I could from tears refrain:
For her griefs so lively shown
Made me think upon my own.
Ah! (thought I) thou mourn'st in vain,
None takes pity on thy pain:
Senseless trees they cannot hear thee,
Ruthless bears they will not cheer thee:
King Pandion he is dead;
All thy friends are lapp'd in lead;
All thy fellow birds do sing,
Careless of thy sorrowing!
Whilst as fickle Fortune smil'd,
Thou and I were both beguil'd.
Every one that flatters thee
Is no friend in misery.
Words are easy, like the wind,
Faithful friends are hard to find.
Every man will be thy friend
Whilst thou hast wherewith to spend;
But if store of crowns be scant,
No man will supply thy want.
If that one be prodigal,
Bountiful thou wilt him call;
And with such-like flattering,
"Pity but he were a king."
If he be addict to vice,
Quickly him they will entice;
But if Fortune once do frown,
Then farewell his great renown.
They that fawn'd on him before,
Use his company no more.
He that is thy friend indeed,
He will help thee in thy need;
If thou sorrow, he will weep,
If thou wake, he cannot sleep:
Thus, of every grief in heart
He with thee doth bear a part.
These are certain signs to know
Faithful friend from flattering foe.

THE best rules to form a young man, are, to talk little, to hear much, to reflect alone upon what has passed in company, to distrust one's own opinion, and value others that deserve it.—TEMPLE.